

Transition-Region/Coronal Signatures of Penumbra Microjets: Hi-C, SDO/AIA and Hinode (SOT/FG) Observations

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Abstract

Penumbra microjets are bright, transient features seen in the chromosphere of sunspot penumbrae. Katsuoka et al. (2007) noted their ubiquity and characterized them using the Ca II H-line filter on *Hinode*'s Solar Optical Telescope (SOT). The jets are 1000–4000 km in length, 300–400 km in width, and last less than one minute. It was proposed that these penumbra microjets could contribute to the transition-region and coronal heating above sunspots. We examine whether these microjets appear in the transition-region (TR) and/or corona or are related—temporally and spatially—to similar brightenings in the TR and/or corona. First, we identify penumbra microjets with the SOT's Ca II H-line filter. The chosen sunspot is observed on July 11, 2012 from ~18:50:00 UT to 20:00:00 UT at ~-145", -300". We then examine the sunspot in the same field of view and at the same time in other wavelengths. We use the High Resolution Coronal Imager Telescope (Hi-C) at 193Å and the 1600Å, 304Å, 171Å, 193Å, and 94Å passbands of the Atmospheric Imaging Assembly (AIA) onboard the *Solar Dynamic Observatory*. We include examples of these jets and where they should appear in the other passbands, but find

no significant association, except for a few jets with longer lifetimes and bigger sizes seen at locations in the penumbra with repeated stronger brightenings. We conclude that the normal microjets are not heated to transition-region/coronal temperatures, but the larger jets are.

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